

NOTES ON THE INDO-AUSTRALIAN BASICEROTINE ANTS
(HYMENOPTERA: FORMICIDAE)

By R. W. TAYLOR*

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Summary

Descriptions and figures are given of *Rhopalothrix orbis*, sp. nov., *R. diadema* Brown & Kempf, *Eurhopalothrix procera* (Emery), *E. greenladei*, sp. nov., *E. isabellae* (Mann), and *E. szentivanyi*, sp. nov., together with distributional and systematic notes on other species, and a key to the Indo-Australian fauna of tribe Basicerotini. *R. orbis* is the first species of its genus recorded from Australia. This paper supplements the world basicerotine monograph of Brown and Kempf [*Studia ent.* 3(1-4), 161-250 (1960).]

INTRODUCTION

The disjunctly distributed Neotropical and Indo-Australian myrmicine tribe Basicerotini was monographed by Brown and Kempf (1960). They recognized seven genera with a total of 40 species. One species in *Rhopalothrix* Mayr and nine in *Eurhopalothrix* Brown & Kempf were listed from the Indo-Australian area. These genera have seven and nine species respectively in the New World (including those described by Kempf 1962).

This paper brings up to date the information available on Indo-Australian basicerotines. A second *Rhopalothrix* species (the first recorded from Australia) is described and two new Melanesian *Eurhopalothrix* species are added, along with systematic and distributional notes on some older species, and a key to the Indo-Australian fauna. The Brown and Kempf monograph contains much information regarding synonymy and distribution which is not repeated here.

The following abbreviations are used for the institutions noted:

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|--------|---|
| ANIC | Australian National Insect Collection, CSIRO, Canberra. |
| BPBM | Bernice P. Bishop Museum, Honolulu, Hawaii. |
| BM(NH) | British Museum (Natural History), London. |
| BSI | Department of Agriculture, Honiara, British Solomon Islands Protectorate. |
| MCZ | Museum of Comparative Zoology, Harvard University, Cambridge, Mass. |
| QM | Queensland Museum, Brisbane. |
| USNM | United States National Museum, Washington, D.C. |

* Division of Entomology, CSIRO, P.O. Box 109, Canberra City, A.C.T. 2601.

MEASUREMENTS AND INDICES

The following measurements and indices derived from them are used:

Total length (TL): sum of axial lengths of body tagmata, including head and closed mandibles, but not extruded parts of sting.

Head length (HL): maximum length of head, frontal view, from occipital lobes to anterior clypeal border.

Head width (HW): maximum width of head, frontal view.

Cephalic index (CI): $HW \times 100/HL$.

Mandibular extension (ML): longitudinal axial distance from level of anterior-most point of clypeus to apex of closed mandibles, with head in HL measuring position.

Mandibulo-cephalic index (MI): $ML \times 100/HL$.

Scape length (SL): Maximum distance from apex of scape to tip of its basal lobe.

Scape index (SI): $SL \times 100/HW$.

Pronotum width (PW): maximum width of pronotum, dorsal view.

Weber's length of mesosoma (WL): maximum diagonal distance, in lateral view, from anterior face of pronotum to inferior propodeal angle.

Dimensions of petiolar, postpetiolar, and gastric segments are given as maximum widths and midline (not necessarily maximum) lengths, measured in dorsal view. A stereomicroscope eyepiece ruler graduated to 0.01 mm was used at 100 \times magnification for all measurements, which are given in millimeters.

KEY TO THE INDO-AUSTRALIAN BASICEROTINI

(Workers)

This key, based partly on Brown and Kempf (1960), includes all known Old World basicerotine species.

1. Mandibles linear, their insertions remote, so that the masticatory borders cross or engage only near their apices (Fig. 1) (genus *Rhopalothrix* Mayr) 2
- Mandibles triangular, their whole serially dentate masticatory borders engaging directly at full closure (Figs. 6, 9, 12) (genus *Eurhopalothrix* Brown & Kempf) 3
- 2 (1). Specialized large hairs on cephalic dorsum numbering 16, with 8 in anterior row (Fig. 1); hairs on disc of first gastric tergite falling into one size class (Fig. 3); mesosomal dorsum with a distinct transverse metanotal impression, the propodeal dorsum forming a transverse tumosity behind it; propodeal teeth well developed, forming angles of about 90° in side view (Fig. 2) (Queensland) *R. orbis*, sp. nov.
- Eighteen specialized hairs on cephalic dorsum, with 10 in anterior row; hairs of first gastric tergite falling into two size classes (Fig. 4); metanotal impression feeble, propodeal dorsum sloping abruptly back towards declivity; propodeal teeth reduced to obtuse vestiges (Fig. 5) (N.E. New Guinea) *R. diadema* Brown & Kempf
- 3 (1). Mandibles with a broad, low, basal tooth, approximately twice as wide at base as the succeeding teeth (Fig. 11); erect clavate hairs (excepting those on gastric apex) restricted to a single pair on verticocapit; HW 0.72–0.89 mm (Ysabel and Vella Lavella, Solomon Is.) *E. isabellae* (Mann)
- Mandibular teeth conical, subequal in size throughout; erect clavate hairs usually not distributed as above; size frequently different 4
- 4 (3). Smaller species, HW < 0.75 mm (*brevicornis* group) 5
- Larger species, HW > 0.93 mm (*procera* group) 10

- 5 (4). Posterior third of head covered thickly with conspicuous, white, orbicular squamiform hairs (including the specialized hairs, which are only weakly differentiated in this species); pilosity of anterior two-thirds of head abruptly reduced to fine, minute vestiges, this area appearing naked by contrast (N.E. New Guinea) *E. biroi* (Szabó)
 Pilosity of head otherwise; either reduced throughout or without an abrupt difference between anterior and posterior sections; specialized larger hairs, when present on dorsum of head, strongly differentiated and more or less erect and clavate 6
- 6 (5). Specialized erect hairs of head absent or reduced to a single median pair on the vertex 7
 Specialized erect hairs on head (when complement is not damaged) 16–18 in number, arranged in 3 transverse rows 8
- 7 (6). Smaller species (HW 0.57–0.60 mm), completely lacking specialized erect hairs on dorsum of head; posterior occipital angles strong, subrectangular, separated by a broad, deep, posterior excision; propodeal teeth projecting and acute, with narrow concave infradental lamellae (N.E. New Guinea) *E. punctata* (Szabó)
 Larger species (HW 0.70–0.74 mm) with a pair of small erect hairs on vertex; posterior occipital angles barely developed, so that the posterior outline of the head (seen full-face) between lateral occipital angles is broadly arcuate, with only a slight median emargination; propodeal teeth obtuse, with broad infradental lamellae (Negros, Philippines) *E. philippina* Brown & Kempf
- 8 (6). Larger species (WL > 0.65 mm); dorsal face of propodeum with an angular impression or "step" at its midlength (New Caledonia) *E. caledonica* Brown & Kempf
 Smaller species (WL < 0.65 mm); dorsal face of propodeum forming an evenly concave slope 9
- 9 (8). Very small species (WL < 0.52 mm); clypeus divided by a transversely arched carina; head bearing 16 large erect hairs, with 8 in the anterior row (New Guinea, New Britain, Guadalcanal) *E. brevicornis* (Emery)
 Slightly larger species (WL > 0.52 mm); head with 18 large erect hairs, 10 in the anterior row (Queensland) *E. australis* Brown & Kempf
- 10 (4). Mandibles broadly triangular, their posterior borders closing directly against the anterior clypeal border, outer borders usually convex, feebly concave in one species (Fig. 6) 11
 Mandibles narrowed, posterior borders oblique, so that a large semicircular space is left between them and the anterior clypeal border at full closure, outer borders distinctly concave (Fig. 12) (N.E. New Guinea) *E. szentivanyi*, sp. nov.
- 11(10). Posterior angles of occipital lobes (in full-face view) very distinctly acute; head, mesosoma and nodes rather coarsely rugose; posterior sides of mesosoma covered with coarse diagonal costation; first gastric tergite, except for a narrow median strip, uniformly covered with conspicuous, subrectangular, squamiform hairs (larger erect hairs differentiated in female, but not in worker); HW > 1.33 (Fiji) *E. emeryi* (Forel)
 Posterior occipital angles slightly obtuse or at most very feebly acute; body variously sculptured, but never so extensively rugose; posterior sides of mesosoma nearly smooth, at most feebly punctulate or shagreened, and in most specimens more or less shining; first gastric tergite with ground pilosity minute, sparsely and unevenly distributed, or obsolete, 1 or more pairs of erect clavate hairs often present on its disc; HW only rarely (in Philippines) exceeding 1.30 mm, usually much less 12
- 12(11). Ventral profile of petiole finely serrate (Fig. 8); first gastric tergite with up to 8 erect clavate hairs arranged in 2 longitudinal rows; head and promesonotum rarely contrasting strongly in sculptural intensity (Philippines, Borneo to Solomon Is. (including Guadalcanal) and Cape York, Samoa; Palau) *E. procer* (Emery)
 Ventral profile of petiole lacking serrations (Fig. 7); first gastric tergite without erect clavate hairs; head smooth, with scattered medium punctures, contrasting strongly with the coarsely rugo-reticulate promesonotal dorsum (Guadalcanal, Solomon Is.) *E. greensladei*, sp. nov.

Genus RHOPALOTHRIX Mayr

Rhopalothrix Mayr 1870, *sensu* Brown and Kempf, 1960, p. 230.

The single previously known Indo-Australian species, *R. diadema* Brown & Kempf, was described from rain forest on the lower Busu River, near Lae, N.E. New Guinea. This species is apparently related to the New World ones through the Colombian *R. ciliata* Mayr. In the neotropics the genus ranges from Cuba and Panama south to Tucumán, Argentina. Illustrations of a *diadema* paratype (MCZ) are given in Figures 4 and 5.

RHOPALOTHRIX ORBIS, sp. nov.

(Figs. 1-3)

Holotype worker

AUSTRALIA: QUEENSLAND: Tamborine Mountain, north side near Curtis Falls (Berlese funnel sample, leafmould, rain forest), 8.v.1953, T. E. Woodward. Deposited in ANIC (Type No. 7503). Dimensions are as follows: TL, c.2.6; HL, 0.61; HW, 0.66; CI, 108; ML, 0.20, MI, 33; WL, 0.66. Similar to *R. diadema*, and agreeing with its original description (Brown and Kempf 1960, pp. 239-40, fig. 59) unless otherwise noted.

Description

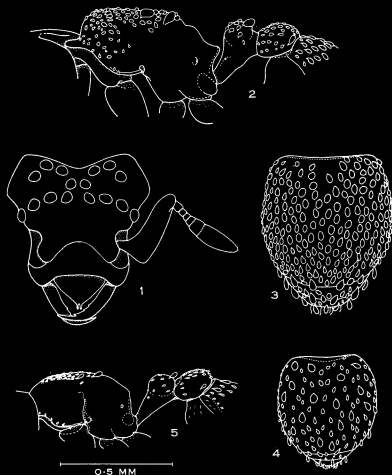
Head shape as in Figure 1, transverse frontal sulcus lacking. Eyes minute, situated as in *R. diadema*. Mandibles narrow; distal half of inner border with 3 crowded, subequal, apically directed, minute denticles; proximal half of inner border edentate; teeth of apical complex as in *R. diadema*. Labrum lacking a mediobasal tumulus.

Mesosoma compact; profile as in Figure 2, summit at posterior edge of mesonotum, metanotal groove impressed, propodeal dorsum strongly convex, propodeal teeth distinct (compare *R. diadema*, Fig. 5). Humeri rounded in dorsal view. Pronotum broader than long, its maximum width 0.41 mm (0.62 times HW, and twice width of propodeal dorsum). Promesonotal sulcus vestigial on mesosomal dorsum. Metanotal groove with several weak transverse ribs. Propodeal dorsum inflated, forming a transverse elliptical welt, which descends abruptly behind towards the bases of the propodeal teeth; the latter parallel in dorsal view, and the propodeal declivity slightly concave. Petiole and postpetiole generally as in *R. diadema*. Postpetiole almost exactly twice the width of petiole and 0.7 times as wide as first gastric tergite. The latter 0.59 mm wide; almost precisely as broad as long.

Entire body densely and finely granulose-punctate and opaque. Ground pilosity of white, orbicular, subappressed, squamiform hairs, distributed as in *R. diadema*, but more abundant, especially on postpetiole and gaster, and less variable in size, especially on head and its appendages. Larger specialized hairs similar in structure and distribution to those of *R. diadema*, except only 8 in anterior arc on head, and 6 on first gastric tergite. Those on the latter form a posterior marginal row across the sclerite, which otherwise bears hairs of a single size class, unlike *R. diadema* (compare Figs. 3 and 4). Colour almost uniformly medium reddish brown, darker than in *R. diadema*.

Paratype worker

QUEENSLAND: Rathdowney, Philp's Farm, Lever's Plateau (Berlese funnel sample, leaf litter, rain forest), 13.iii.1966, J. B. Williams. Deposited in QM.



Figs. 1-5.—Indo-Australian *Rhopalothrix* species (workers). 1-3, *R. orbis*, sp. nov., holotype: 1, head, frontal view; 2, mesosoma, petiole, and postpetiole, lateral view; 3, first gastric tergite, dorsal view. 4 and 5, *R. diadema* Brown & Kempf, paratype: 4, first gastric tergite, dorsal view; 5, mesosoma, petiole, and postpetiole, lateral view.

Except for its larger size, this specimen agrees with the holotype in all apparently significant features. It has the following dimensions: TL, c.2.8; HL, 0.62; HW, 0.69; CI, 111; ML, 0.22; MI, 35; WL, 0.70; PW, 0.44; width of first gastric segment, 0.66. The enlarged hairs of the first gastric tergite are proportionately smaller than in the holotype.

Discussion

R. orbis is the first species of *Rhopalothrix* to be recorded from Australia. It is obviously closely related to *R. diadema* but the two species are easily distinguished by their different dimensions and proportions, as well as the major characters utilized in couplet 2 of the key presented above.

Genus EURHOPALOTHRIX Brown & Kempf

Eurhopalothrix Brown and Kempf, 1961, p. 44.*

Brown and Kempf divided the Indo-Australian *Eurhopalothrix* species into three groups: those of *brevicornis*, *biroi*, and *procera*. I consider the *biroi* group unnecessary, and would assign *biroi* (Szabó) and *philippina* Brown & Kempf to the *brevicornis* group, and *isabellae* (Mann) to the *procera* group.

The brevicornis Group

In addition to *biroi* and *philippina* this group includes *E. brevicornis* (Emery), *E. australis* Brown & Kempf, *E. caledonica* Brown & Kempf, and *E. punctata* (Szabó). These are small species (worker HW less than 0.75 mm), usually with square-cut occipital lobes and an evenly arched mesosomal profile, which is not markedly depressed behind the promesonotum (Brown and Kempf 1960, figs. 50–55). The pronotal and postpetiolar dorsa are not notably bilaterally tumose, and the sculpturation is generally granulose-punctate throughout.

E. brevicornis, *E. australis*, and *E. caledonica* appear to be related and are probably primitive. They have similar propodeal profiles (Brown and Kempf 1960, figs. 55, 51, 52), fairly complete patterns of large specialized hairs on the head and gaster (Brown and Kempf 1960, figs. 44–6), and at least a few large bilaterally paired hairs on the mesosoma and nodes. The outer mandibular borders are convex.

Judging from propodeal structure and other characters, *E. australis* and *E. caledonica* are probably cognate. *E. biroi* is similar to these species, but it has concave outer mandibular borders, a more even mesosomal profile, a longer petiolar node, and it lacks specialized hairs on the first gastric tergite, although the nodes each bear 1 pair. The head has an almost full complement of specialized hairs, but these are reduced in size, and the usually inconspicuous hairs of the ground pilosity on the vertex are almost as large (Brown and Kempf 1960, fig. 42). *E. philippina* has the occipital lobes rounded posteriorly (Brown and Kempf 1960, fig. 47), but otherwise resembles *biroi* in habitus. The ground pilosity is not hypertrophied, specialized hairs are lacking on the nodes, and there is only 1 pair on the vertex. *E. punctata* is smaller, but similar in habitus to *biroi*; it has inconspicuous ground pilosity, convex outer mandibular borders, a shorter petiolar node, and it lacks specialized erect hairs on the head, mesosoma, nodes, and first gastric tergite. These last three species may be members of a single phyletic line descended from *brevicornis*-like stock, or they may represent two or three separate lineages. Distributions of all these species are summarized in the key above.

* Following their original (1960) omission in not indicating a type species for *Eurhopalothrix*, Brown and Kempf (1961) subsequently designated *Rhopalothrix bolau* Mayr as type species. The genus was not validly published until that time.

EURHOPALOTHRIX BREVICORNIS (Emery)

Rhopalothrix brevicornis Emery, 1897, p. 572.

Eurhopalothrix brevicornis: Brown and Kempf, 1960, p. 215.

The following records considerably extend the range of this species (previous records are from N.E. New Guinea and New Britain): BRITISH SOLOMON ISLANDS: VELLA LAVELLA: 7.v.1966, P. J. M. Greenslade (Acc. No. 22876), a single worker. GUADALCANAL: Mt. Austen, near Honiara (Berlese funnel samples, leaf litter and humus, secondary rain forest, c. 1000 ft), 25.ii.1963, 11.iii.1963, 9.vii.1963, 13.ii.1964, March 1966, 4.vii.1966, Dr. or Mrs. P. J. M. Greenslade (Acc. Nos. 4578, 6743, 8093, 15028, 21317, 23350); Mt. Austen Rd., 10.viii.1966, P. J. M. Greenslade (Acc. Nos. 23453, 23486). The Guadalcanal material includes four dealate queens and 17 workers. The specimens show no significant variation from New Guinea and New Britain samples (MCZ collection). The Greenslades' field records suggest that *E. brevicornis* nests in leafmould, probably in small rotting wood fragments.

EURHOPALOTHRIX sp.

A single dealate queen in the ANIC could represent an undescribed species or, just possibly, the female of *E. punctata*. N.E. NEW GUINEA: Kunai Creek, Bulolo River Valley, above Wau (Berlese funnel sample, leafmould, midmontane rain forest, c. 1300 m), June 1962, R. W. Taylor (Acc. No. 1466). Dimensions are: HL, 0.60; HW, 0.64; CI, 107; SL, 0.34; greatest diameter of eye, 0.14; WL, 0.80. Close in habitus to *E. brevicornis* female (Brown and Kempf 1960, p. 216), except for larger size and proportionately longer mesosoma. Sculpturation and pilosity similar; middle rank of specialized cephalic hairs lacking (abraded?); first gastric tergite without specialized large hairs, the ground pilosity fine, similar to that of *E. punctata* workers in MCZ collection. First gastric tergite coarsely and closely punctate, slightly less densely so than in *E. punctata* workers.

Many ant species taken at Kunai Creek by the author in 1962 are widespread in, and apparently endemic to, New Guinean midmontane rain forest. Most have a widespread, probably cognate lowland relative. The above female could represent a highland endemic *Eurhopalothrix* species derived from *brevicornis*-like stock.

EURHOPALOTHRIX AUSTRALIS Brown & Kempf

Eurhopalothrix australis Brown and Kempf, 1960, p. 161.

Previous records are from Crawford's Lookout and Mt. Coot-tha, Qld. I have seen three workers from the following additional localities. AUSTRALIA: QUEENSLAND: Lake Eacham National Park, Atherton Tableland (Berlese funnel sample, leafmould, rain forest, c. 800 m), 7.vi.1962, R. W. Taylor (Acc. No. 1692), ANIC. Clump Point, near Tully (Berlese funnel sample, rain forest, near sea level), 3.vi.1953, T. E. Woodward, QM. Vicinity of Mt. Glorious (Berlese funnel sample, leafmould), 27.v.1952, T. E. Woodward, QM. No apparently significant variation is shown by this material.

The procera Group

The following species are included: *procera*, *emeryi* (Forel), *isabellae*, *greensladei*, sp. nov., and *szentivanyi*, sp. nov.; their distributions are summarized in the key above.

The workers are usually longer than in the *brevicornis* group (HW exceeding 0.89 mm in all species except *E. isabellae*, which has a minimum known HW of 0.72 mm), and they have similarly shaped heads. The mesosomal profile is more or less distinctly "stepped," with the propodeal dorsum lower than the promesonotal. The pronotal dorsum is usually obtusely gibbous on each side, and the postpetiolar dorsum has a median longitudinal impression separating a pair of convex tumosities. Sculpturation of individual specimens is less uniform than in the *brevicornis* group. All species except *E. emeryi* have a single pair of erect hairs on the verticocaput, and erect humeral hairs are present in *E. procera* and *E. greensladei*. In *E. emeryi* the hairs of the ground pilosity are longer, more abundant, and more prominent than in the other species; some workers have several slightly enlarged suberect hairs on the vertex and a pair on the humeri, which are possibly homologous with the erect hairs of the other species. *E. procera* has specialized erect hairs in 2 longitudinal rows on the first gastric tergite; maximally there are 8, but they show geographical variation in number. Six to 10 similar hairs are present in queens (but not workers) of *E. emeryi*; they are lacking in the other species.

The mandibles are triangular and usually have convex outer borders. Important exceptions are *E. isabellae* and *E. szentivanyi*, which have the outer borders concave and the basal borders oblique, leaving a more or less triangular or semicircular gap between the clypeus and mandibles when the latter are closed (Figs. 9, 12). The mandibular dentition consists of a single row of high conical teeth in all species except *E. isabellae*, which has a broad lamellate basal tooth, about twice as wide at its base than the preceding teeth (Fig. 11). Variation in sculpturation and pregastric pilosity in all species, except *E. emeryi*, is almost encompassed by intraspecific variation in the widespread and probably primitive *procera*. It seems likely that *E. isabellae* is derived from a *procera*-like ancestor through stock similar to *E. greensladei*, while *E. emeryi* and *E. szentivanyi* are apparently derived separately from *procera*-like stock.

The group is probably descended ultimately from *brevicornis*-like ancestors. However, the similarly reduced erect cephalic pilosity of the *brevicornis* group species *philippina*, discussed above, is probably a convergent development, and need not indicate direct relationship between this species and the *procera* group.

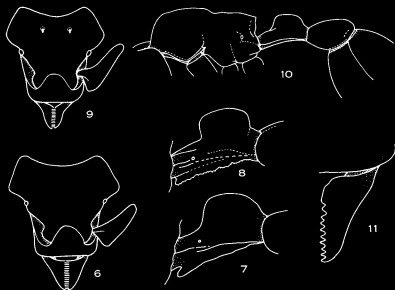
EURHOPALOTHRIX PROCERA (Emery)

(Fig. 8)

Rhopalothrix procera Emery, 1897, p. 572.*Eurhopalothrix procera*: Brown and Kempf, 1960, p. 225.

Specimens constituting the following new records confirm the details of geographical variation reviewed by Brown and Kempf (1960, pp. 228-30, fig. 56). PAPUA: Brown R. (18 workers from rotting branch, primary lowland rain forest) June 1962, R. W. Taylor (Acc. No. 2013), ANIC, MCZ. BRITISH SOLOMON ISLANDS: YSABEL: Regi (one worker, in log, native garden), 22.vii.1963. SAVO:

eastern side (six workers, in sticks and litter, deep gully liable to flooding), 20.xii.1962. GUADALCANAL: Kukum (four workers, in rotting log), 22.v.1963; Roroni (dealate female, base of moribund cocoa tree, in litter), 2.vii.1965. SAN CRISTOVAL: Warahita (one worker, tree stump), 29.vii.1965, and collected by Dr. or Mrs. P. J. M. Greenslade (Acc. Nos. 9567, 3281, 5501, 5317, 18777A), ANIC, BSI, MCZ. WESTERN SAMOA: UPOLU: Afiamalu (several colonies and strays from rotting wood and Berlese funnel samples, disturbed upland rain forest), 3.iv.1962, R. W. Taylor and W. Taylor (Acc. Nos. 218, 227, 274, 329, 252, 580, 2316, 2321), ANIC, MCZ.



Figs. 6-11.—Indo-Australian *Eurhopalothrix* species (workers). 6 and 7, *E. greensladei*, sp. nov., holotype: 6, head, frontal view; 7, petiole, lateral view; 8, *E. procera* (Emery), specimen from Guadalcanal: petiole, lateral view; 9 and 10, *E. isabellae* (Mann), holotype: 9, head, frontal view; 10, mesosoma, petiole, and postpetiole, lateral view; 11, *E. isabellae* (specimen from Vella Lavella), mandibular dentition.

All available specimens of *E. procera*, from all parts of its range, have the ventral petiolar profile finely but distinctly serrate, usually as shown in Figure 8, but somewhat weaker in Philippine and Micronesian samples. The serrations are developed on a narrowly Y-shaped system of fine carinae (the base of the Y anterior) which form part of the subpetiolar process. The other *procera*-group species do not possess this character, although it is vestigially represented in some *E. szentivanyi* specimens.

E. procera occurs along with *E. greensladei* on Guadalcanal. The following notes on the 10 Savo and Guadalcanal specimens are necessary for reference in diagnosing *E. greensladei*.

Dimensions.—TL, 4.0-4.5; HL, 0.93-1.00; HW, 1.00-1.08; CI, 106-110; ML, 0.26-0.30; MI, 28-30; SL, 0.57-0.62; SI, 55-57; greatest diameter of eye, 0.08-0.09; PW, 0.59-0.65; WL, 1.13-1.24; petiolar node width, 0.25-0.28;

postpetiole width, 0.57–0.62; gastric width, 0.75–0.84. Outer mandibular borders straight to feebly convex. Lateral gibbositities of pronotal dorsum distinct, separated by a shallow depression, which is continuous behind with the apex of a broadly V-shaped indentation which represents the promesonotal sulcus; the latter distinct on sides of mesosoma. Petiolar dorsum slightly broader than long; ventral margin of subpetiolar process finely serrate (Fig. 8). Postpetiolar tumosities well developed, moderately acute; depression separating them maximally about 0.25 times as deep as distance between their apices.

Mandibles and clypeus subopaque, obscurely granulose. Frons subopaque, ground sculpturation as on clypeus, with a superimposed, almost effaced, fine reticulate rugosity; the latter reduced on posterior vertex and occipital lobes, which are moderately granulose. Occipital area moderately shining. Promesonotal dorsum fairly coarsely rugo-reticulate, grading to punctate-granulose anteriorly and laterally. Propodeal dorsum moderately shining, with numerous fine shallow punctures; meso- and metepisternal areas and sides of propodeum smooth and shining, with a few scattered punctures. Propodeal spines, declivity, and infradental lamellae finely granulose. Petiole and postpetiole subopaque, moderately granulose. Exposed parts of gastric sclerites coarsely and closely punctate; punctures of first tergite slightly less than 0.01 mm in diameter, separated by intervals of about half this distance; punctural coarseness diminishing posteriad.

Ground pilosity consisting of scattered short, thick, white, appressed clavate hairs, distributed as follows: most numerous on mandibles, scapes, clypeus, frontal carinae, and outer edges of occipital lobes; less abundant and finer on frons and vertex; moderately dense on dorsum of promesonotum, and on the petiolar and postpetiolar dorsa, where there is a narrow, hairless median strip; a few on propodeal teeth. Vertex and pronotum each with a single pair of longer erect clavate hairs. Three to 6 similar hairs on first gastric tergite (these are probably reduced by wear—all 8 positions occupied in other samples of *procera* are represented in the series). Second and third gastric tergites with single transverse rows of similar hairs. Apex and posteroventral aspects of gaster with erect, coarse, bristle-like hairs. Ten to 12 erect clavate hairs along outer edge of scape. Legs (except coxae, upper surfaces of femora, and apical tarsal segments) with numerous short orbicular hairs. Fine unspecialized pilosity on apices of mandibles and scapes, funiculi and tarsi. Colour dull dark reddish brown, legs and antennae slightly lighter.

EURHOPALOTHRIX GREENSLADEI, sp. nov.

(Figs. 6, 7)

Holotype worker

BRITISH SOLOMON ISLANDS: GUADALCANAL: Mt. Austen (Berlese funnel sample, leaf litter, secondary rain forest c. 1000 ft), 21.iv.1965, P. J. M. Greenslade (Acc. No. 16991). Deposited in MCZ (Type No. 31180).

Paratype workers

GUADALCANAL: Mt. Austen, four specimens collected with the holotype and nine collected separately in leaf litter, Berlese funnel samples (each record a single specimen unless otherwise noted), 11.ii.1963, 25.iv.1963, 29.xi.1963, February 1966

(2 specimens), March 1966 (4 specimens). Kukum, in decayed log, 22.vi.1963. All material collected by Dr. or Mrs. P. J. M. Greenslade (Acc. Nos. 4290, 6314, 11048, 21210, 21316, 6779). Deposited in ANIC, BM(NH), BSI, MCZ, USNM.

Mt. Austen (9°28'S., 159°59'E.) is 4 miles inland from Kukum, which is a Solomon Is. Department of Agriculture farm on the coast, about 4 miles east of Honiara.

Description

Dimensions (holotype cited first): TL c. 4.2, 4.0–4.6, HL, 0.94, 0.92–0.98; HW, 1.05, 1.03–1.08; CI, 112, 110–114; ML, 0.26, 0.25–0.27; MI, 28, 27–28; SL, 0.56, 0.54–0.57; SI, 53, 52–53; greatest diameter of eye, 0.08, 0.08–0.09; PW, 0.60, 0.58–0.61; WL, 1.13, 1.10–1.14; petiolar node width, 0.25, 0.24–0.26; postpetiole width 0.61, 0.57–0.62; gastric width, 0.82, 0.78–0.83. General features as shown in Figures 6 and 7. Similar to *E. procera* but differing from its Guadalcanal race, as described above, in the following characters:

- (1) Size and proportions: smaller size, with relatively broad head (higher CI), short mandibles (lower MI), and short scapes (lower SI).
- (2) Outer mandibular borders feebly but distinctly concave.
- (3) Pronotal gibbositities very feeble; the dorsum of the sclerite barely depressed in the middle.
- (4) Promesonotal sulcus lacking on dorsum of mesosoma and vestigial on its sides. Promesonotal dorsum, in side view, less strongly inflated.
- (5) Dorsum of petiolar node slightly longer than broad.
- (6) Ventral edge of subpetiolar process entire, lacking serrations.
- (7) Postpetiolar tumosities weakly developed, relatively obtuse; the depression between them maximally about 0.1 times as deep as the distance between their apices.
- (8) Sculpturation of mandibles, antennae, and legs as in Guadalcanal *procera*. Clypeus moderately shining, with almost effaced traces of dense, coarse puncturation. Frons moderately shining, with scattered, weakly incised, large punctures (average diameter and distance of separation about 0.02 mm). Promesonotal dorsum very coarsely longitudinally rugo-reticulate. Dorsum and sides of propodeum subopaque, coarsely and irregularly punctate; declivity finely granulose. Sides of mesosoma coarsely punctate, except for small areas on inferior edges of pronotum, and lower parts of the mes- and metepisterna, which are smooth, with a few scattered large punctures. Petiole and postpetiole moderately coarsely granulose-punctate, most strongly on petiolar dorsum and apices of postpetiolar tumosities. Gastric puncturation much less sharply and clearly incised than in *procera*.
- (9) Vestiture much weaker, except on legs and antennae. Hairs of ground pilosity smaller; very scattered on clypeus, lacking on frons (except for a few on outer corners of occipital lobes); moderately abundant, though not prominent, on promesonotum and petiolar dorsum; generally restricted on postpetiolar dorsum to apices of lateral tumosities. One bilateral pair of

erect, bristle-like, feebly clavate hairs each on verticociput and pronotal humeri. Erect hairs completely lacking on first gastric tergite. Second and third gastric tergites each with a single transverse row of erect, feebly clavate bristles; similar but less clavate bristles moderately abundant at apex of gaster and on its venter, the most anterior lying at about mid-length of first sternite.

- (10) Colour dark reddish brown; mandibles, clypeus, antennae, legs and tip of gaster lighter.

Discussion

P. greensladei is probably cognate with *E. procera*. It is remarkably intermediate in structure between *procera* and the following species *E. isabellae*. Most of the characters listed above, which distinguish *greensladei* from *procera*, are present also in *isabellae*, frequently in a more exaggerated state. Furthermore, several extreme characters of *isabellae* (notably the aberrant mandibular form, the heavy mesosomal sculpturation, and the very reduced vestiture) are foreshadowed in *greensladei*.

EURHOPALOTHRIX ISABELLAE (Mann)

(Figs. 9-11)

Rhopalothrix isabellae Mann, 1919, p. 375, fig. 35, worker. Type locality: Ysabel I., Solomon Is.
Eurhopalothrix isabellae; Brown and Kempf, 1960, p. 225.

Several years ago I examined, measured, and figured the unique holotype of *E. isabellae* (USNM Collection), through the courtesy of Dr. Marion R. Smith. Several additional specimens have recently come to hand. They differ from the holotype in the details itemized below, and could represent a separate, very closely related species. However, considering the extreme variability of the related *E. procera*, I believe that they represent a geographical or other variant of *isabellae*. I have been unable to compare them directly with the holotype, but Dr. D. R. Smith (USNM) has generously done so. His notes and drawings assisted greatly in the preparation of this discussion.

Holotype worker (Figs. 9, 10)

Dimensions: HL, 0.85; HW, 0.89; CI, 105; SL, 0.55; SI, 62; greatest diameter of eye, 0.06; PW, 0.52; WL, 1.07; petiolar node width, 0.26. The following notes supplement Mann's original description:

- (1) Basal mandibular tooth a broad, low, blade-like structure, about twice as wide at base as the acutely triangular succeeding teeth (as in Fig. 11).
- (2) Dorsum of petiolar node distinctly longer than broad, its midline length almost 1.2 times the maximum width.
- (3) Head feebly shining, with somewhat effaced medium punctate-rugosity. Mes- and metepisternites, posterolateral parts of propodeum, and lateral areas of petiolar peduncle shining, moderately finely punctate. Propodeal declivity smooth and shining, divided transversely by a fine carina. Gastric sclerites moderately shining, almost entirely cribrately punctate (punctural diameters and interpunctural distances averaging about 0.01 mm).

Additional worker material

The abovementioned recent accession extends the known range of *isabellae* as follows: BRITISH SOLOMON ISLANDS: VELLA LAVELLA: Barakoma, 17.vi.1965, P. J. M. Greenslade (Acc. No. 19040), six workers. Deposited in ANIC, BM(NH), MCZ, and USNM. These specimens have the following dimensions: TL, c. 2.9–3.5; HL, 0.69–0.82; HW, 0.72–0.86; CI, 104–105; ML, 0.20–0.23; MI, 28–29; SL, 0.41–0.50; SI, 57–60; greatest diameter of eye 0.06–0.08; PW, 0.42–0.49; WL, 0.78–0.95; petiolar node width, 0.20–0.22; postpetiole width, 0.45–0.51; gastric width, 0.29–0.34. They differ from the holotype as follows:

- (1) Smaller size.
- (2) Mandibles less narrowed anteriorly and thus more distinctly triangular, with outer borders less concave and posterior borders slightly less oblique, so that the triangular gap between the closed jaws and the clypeus is less extensive.
- (3) Occipital border slightly less deeply emarginate in frontal view.
- (4) Metanotal groove less distinctly impressed on mesosomal dorsum.
- (5) Petiolar dorsum at most only minutely longer than broad.
- (6) Median longitudinal depression of postpetiole less pronounced.
- (7) Head less distinctly sculptured, obscure and finely punctate-rugose, the overall effect perhaps best described as coarsely shagreened. Mes- and metepisternites, posterolateral parts of propodeum, and sides of petiolar peduncle smooth, but less strongly shining than in holotype, due to an overall minutely granular micro-sculpture, which has a slight metallic lustre in some lights. Propodeal declivity divided into upper and lower portions by a sharp transverse carina; lower portion impunctate, smooth and shining; upper portion subopaque, with scattered fine punctures and with 4 or 5 vague transverse rugae, best seen in crosslight. First gastric tergite moderately shining, with vestigial traces of effaced coarse puncturation, most distinct at edges. Sternite coarsely punctate, as in holotype.
- (8) Cephalic ground pilosity as in *greensladei*, essentially lacking on frons except for outer edges of occipital lobes. Dorsa of petiole and postpetiole with distinct, scattered, whitish hairs, about 0.02 mm long. (The hairs in these positions are much less distinct on the holotype, which has them distinctly developed on the frons, unlike the Vella Lavella specimens). Enlarged erect hairs restricted to a single verticoccipital pair, and those at gastric apex, as in the holotype.
- (9) Colour as in *E. greensladei*, somewhat darker than the holotype is currently; judging from Mann's description the latter has probably faded.

Discussion

The mandibular form and dentition immediately distinguish this peculiar species. The mesosomal sculpturation is heavier than that of any known *procera* variant, and the vestiture is less strongly developed. *E. isabellae* appears to be derived from a *procera*-like ancestor, through stock similar to *E. greensladei*.

EURHOPALOTHRIX SZENTIVANYI, sp. nov.*

(Figs. 12-15)

Holotype worker

N.E. NEW GUINEA: Bulolo River Valley, 6 km NE. of Wau (ex rotting log, lower montane oak-*Araucaria hunsteinii* rain forest, 1100 m), July 1962, R. W. Taylor (Acc. No. 1917). Deposited in MCZ (Type No. 31181).

Paratypes

Four workers with same data as holotype (nidoparatypes), deposited in ANIC, BPBM, MCZ, USNM. A dealate queen from the same locality (ex Zoraptera-stage rotting log), R. W. Taylor (Acc. No. 2013), deposited in ANIC.

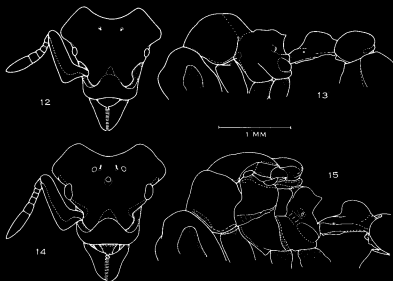
Description of worker

Dimensions (holotype cited first): TL, c. 5·6, 5·4-6·0; HL, 1·28, 1·27-1·33; HW, 1·41, 1·34-1·45; CI, 110, 106-110; ML, 0·46, 0·45-0·48; MI, 36, 35-36; SL, 0·77, 0·74-0·79; SI, 55, 54-55; greatest diameter of eye, 0·15, 0·13-0·17; PW, 0·85, 0·82-0·88; WL, 1·56, 1·48-1·62; petiolar node width, 0·34, 0·32-0·36; postpetiole width, 0·73, 0·71-0·76. Head, mandibles, and antennae as shown in Figure 12. Frons moderately inflated, frontal tumosities feebly developed. Basal mandibular and anterior clypeal borders enclosing a large semicircular gap at full mandibular closure. Labrum tongue-shaped, slightly longer than basal width, apex broadly rounded. Face of scape strongly convex, longitudinally grooved along outer edge. Promesonotum strongly vaulted, much higher than propodeum (Fig. 13). Humeri rounded in dorsal view; pronotal gibbosities feebly inflated. Promesonotal sulcus a faint, shallow impression on mesosomal dorsum, not incised above spiracles. Metanotal groove distinct, transversely ribbed. Propodeal spines small, diverging from midline at angles of about 45°, bases connected by a fine transverse carina; infradental lamellae reduced to fine carinae. Dorsum of node about as wide as long. Subpetiolar process with vestiges of serrations probably homologous with those of *E. procera*. Postpetiole about two-thirds as long as broad; dorsolateral tumosities moderately developed. Gaster about 1·4 times wider than postpetiole.

Mandibles shining, moderately coarsely and closely punctate. Scapes finely granulose. Clypeus moderately shining, with effaced coarse puncturation. Frons very shiny, with irregularly scattered foveolate punctures, separated by distances of 2-3 times their average diameter (c. 0·025 mm). Mesosoma mostly smooth on sides and along a narrow median longitudinal strip; these surfaces shining, with a hazy bluish "bloom". The following areas coarsely punctate-rugose: a narrow band across pronotal collar, extending to inferior angles laterally; an approximately triangular dorsolateral patch on each pronotal humerus; sides and posterodorsal parts of propodeum. Front and sides of pronotum and anterior propodeal dorsum with a few scattered foveolate punctures. Mesonotum with a narrow longitudinal band of foveolate punctures on each side of median strip. Propodeal declivity finely granulose.

* This elegant species is named for Dr. J. J. H. Szent-Ivany in appreciation of his splendid assistance and hospitality during the author's New Guinea field studies.

Dorsolateral aspects of node and postpetiole coarsely punctate-rugose, both segments with a hazily shining median longitudinal strip. First gastric tergite smooth, strongly reflective, with a few weakly incised foveolate punctures, and without a bluish bloom, which is present on sternite. Truncate anterior face of first gastric segment granulate (like propodeal declivity). Apical gastric sclerites weakly shagreened; traces of such sculpturation on extreme sides and posterior edge of first tergite, and on posterior third of its sternite, which also bears a few obscure coarse punctures. Legs generally finely granulate.



Figs. 12-15.—*Eurhopalothrix szentivanyi*, sp. nov. 12 and 13, holotype worker: 12, head, frontal view; 13, mesosoma, petiole, and postpetiole, lateral view. 14 and 15, paratype queen: 14, head, frontal view; 15, mesosoma, petiole, and postpetiole, lateral view.

Ground pilosity of 0.03–0.08 mm long, moderately clavate white hairs, abundant on clypeus, frontal lobes, scapes and postgenal areas; smaller and less abundant on frons, except around eyes and edges of occipital lobes. Mandibular pilosity very reduced, except for bristle-like hairs among the teeth. Funiculi finely pubescent. Hairs like those of clypeus abundant on sculptured areas of mesosoma and nodes, which are otherwise virtually naked. Legs, except outer coxal surfaces, with dense, short, thick, clavate hairs. Gastric pilosity reduced; a few long clavate hairs at apex, shorter ones on sculptured area of first sternite. Erect specialized pilosity reduced to a single bilateral pair of verticoccipital hairs, c. 0.07 mm long.

Colour dark reddish brown, almost black, gaster slightly lighter. Clypeus, frontal lobes, and area of propodeal-petiole junction infuscated medium reddish brown. Mandibles, antennae, and legs medium sienna-brown.

Queen (Figs. 14–15)

Dimensions: TL, c. 6.7; HL, 1.40; HW, 1.55; CI, 111; ML, 0.49; MI, 35; SL, 0.82; greatest diameter of eye, 0.27; WL, 1.85. Similar to worker, but with ocelli

and complete mesosomal structure. Pronotum with coarsely granulose humeral patches, mesoscutum somewhat indefinitely longitudinally sculptured, with a depressed smooth posteromedian area. Scutellum coarsely punctate-rugose, with a slight longitudinal trend. Ground pilosity as in worker, scutum and scutellum with a few indistinct small hairs. Bilaterally paired erect specialised hairs on verticociput and mesosomal dorsum, those on the latter distributed as shown in figures.

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